

School Norovirus Outbreak in Connecticut, 2023

Background

Norovirus, a highly contagious virus, is the most common cause of vomiting and diarrhea from acute gastroenteritis in the United States (1). Norovirus is spread via the fecal-oral route and is extremely contagious because only a small number of infectious particles can make someone ill. The virus can remain infectious on surfaces and objects for up to two weeks and is resistant to many common disinfectants (2). Norovirus outbreaks commonly occur in schools and other congregate settings, causing absences, interruptions in operations, and logistical challenges. Local health departments play a key role in outbreak investigation and management.

On February 9, 2023, a local health department (LHD) was notified of a potential outbreak at a Connecticut school in their district. Initially, the LHD was notified of several students and staff experiencing gastrointestinal illness (GI) including nausea, vomiting, and diarrhea. The LHD received notification of additional cases in the following days.

Staff at the LHD worked with the school to investigate the outbreak and implement infection control and prevention measures. This article summarizes actions taken including collecting case reports, conducting an environmental assessment, interviewing food service workers (FSWs), collecting stool specimens, and providing recommendations for mitigation strategies.

Epidemiological Investigation

The school nurse collected epidemiologic data from students and non-FSW staff that reported GI illness. Case information included name, grade/staff role, symptoms, and onset and resolve dates/times. A case was defined as an individual experiencing

INSIDE

Page

School Norovirus Outbreak in Connecticut, 2023	26
The Impact of the COVID-19 Pandemic on Invasive Group A <i>Streptococcus</i> Incidence in Connecticut	28

vomiting and/or diarrhea who worked at or attended the school during the outbreak period.

A total of 164 people reported illness including 127 students and 39 staff. The outbreak resulted in an overall attack rate of 25.3% of students and 35.5% of staff. Cases were reported from all grades (6 – 12) as well as from staff in multiple departments. Primary clinical manifestations included vomiting (n=122 [74% of cases]), diarrhea (n=85 [52%]), and abdominal cramps (n=22 [13%]). The mean duration of illness was 20.6 hours (range 4 – 96 hours). Reported symptoms and duration of illness indicated probable norovirus infection. Although no single exposure was identified, the epidemiologic curve suggested a possible point-source exposure due to a large number of cases reported over a 3-day period. [Figure 1]

Environmental Investigation and Control Measures

The LHD performed an environmental investigation of the school dining facilities. Proper glove use and hand washing was noted. Signage about what to do when ill was not provided in all languages used by FSWs. A student was observed eating chips with bare hands out of a communal bowl. In response, self-serve dining options were immediately interrupted and provision of pre-

CONTACT INFORMATION

Connecticut Department of Public Health
Infectious Diseases Section
410 Capitol Avenue/MS#11FDS
Hartford, CT 06134
Phone: 860-509-7995
Fax: 860-509-7910

packaged, single-serve items, including sandwiches, salads, and bags of chips, were implemented.

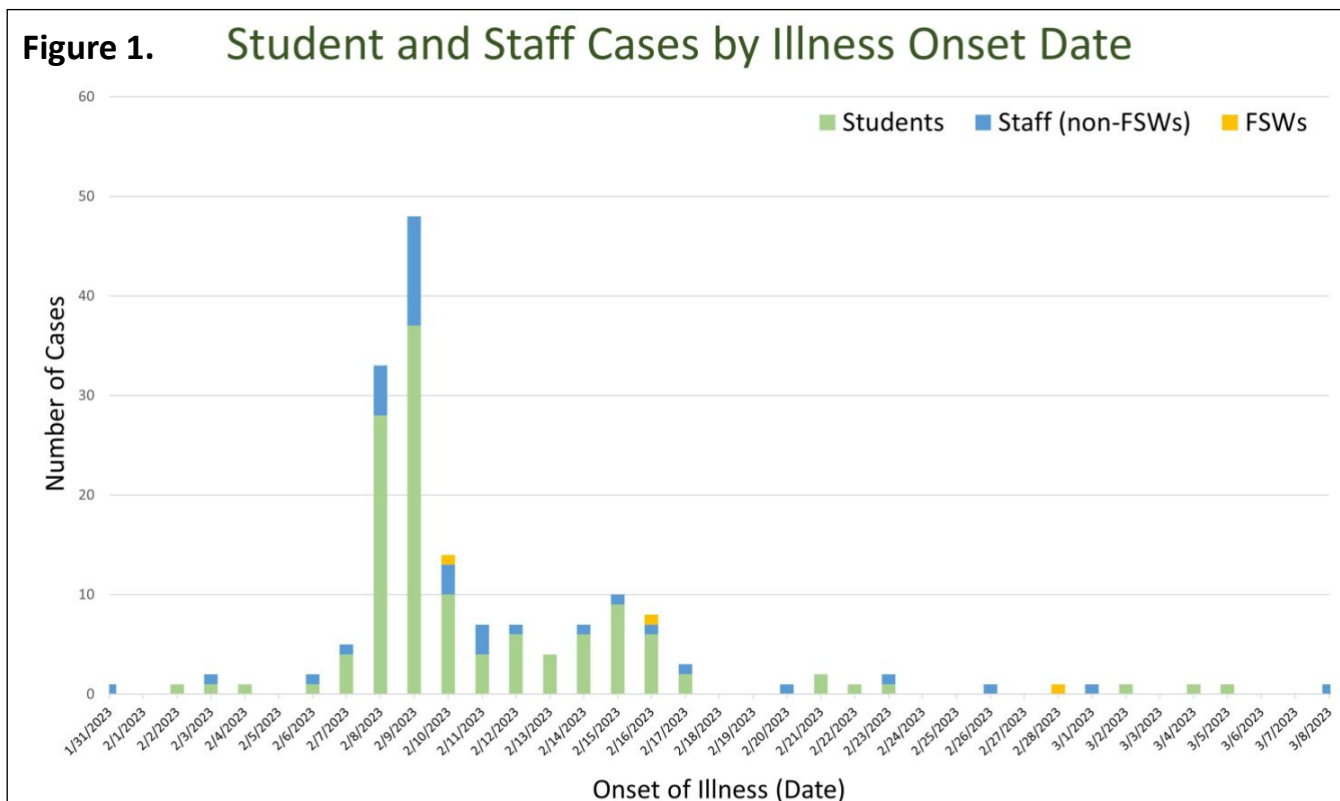
Local health department staff interviewed all eight FSWs using a food employee interview form. Three FSWs reported experiencing symptoms of vomiting and diarrhea with symptom onset dates of 2/10/23, 2/16/23, and 2/28/23. No FSWs reported working while ill. Stool specimen collection kits were distributed to and collected from three FSWs (two symptomatic, one previously symptomatic but asymptomatic at time of collection). The LHD provided food service management with advice on best practices for food safety and preventing transmission of foodborne illness. Additional training on hand hygiene was provided by management.

Investigation of routine cleaning practices prior to the outbreak found them to be insufficient to effectively reduce transmission due to use of

disinfectant that was not effective against norovirus and inadequate frequency of disinfection. The school hired a third-party cleaning company for enhanced environmental cleaning with a Food and Drug Administration (FDA) approved disinfectant effective against norovirus multiple times per day following report of the outbreak. The school closed for deep cleaning the day after reporting the outbreak to the LHD.

Control measures recommended by the LHD and implemented by the school included increased environmental cleaning; exclusion of ill persons for at least 48 hours after symptoms ceased; restriction of extracurricular group activities and events including rehearsals, sporting events, and team dinners; education on hand hygiene; posting signage about what to do when ill for FSWs in appropriate languages; and modifications to dining hall operations.

Figure 1. Student and Staff Cases by Illness Onset Date



Laboratory Investigation

Stool specimens collected from three FSWs, one staff member, and three students were tested at the DPH State Public Health Laboratory (SPHL). Among collected specimens, five (71%) tested positive for Norovirus Genotype I by reverse transcription polymerase chain reaction (RT-PCR). Sequence analysis was conducted on the five positive specimens by the Wadsworth Center Laboratory in New York. Four of the samples were identified as GI.3[P13]. Genotype could not be determined for the remaining sample.

Discussion

The investigation indicated that the outbreak was caused by norovirus. The strain of norovirus identified from genotype sequencing (GI.3[P13]) was seen in 5% of all norovirus outbreaks reported to CaliciNet, a national norovirus outbreak surveillance network, from September 2022 through February 2023 (3). When a norovirus outbreak occurs in a congregate setting, prompt notification and implementation of stringent prevention and control efforts is necessary to reduce the incidence of illness and duration of an outbreak. Education is essential to decrease transmission and risk of illness. To prevent norovirus outbreaks, it is important to stay home when ill, wash hands with soap and water, properly disinfect after bouts of vomiting or diarrhea, and avoid preparing food for others when ill (4).

Reported by

Local Health Department Staff

Acknowledgements

We thank the school nurse for diligence in collecting case report information and communication. We also thank the Connecticut Department of Public Health for their guidance and support.

References

- Centers for Disease Control and Prevention. (2021, March 5). Burden of norovirus illness in the U.S. Centers for Disease Control and Prevention. Retrieved April 17, 2023, from <https://www.cdc.gov/norovirus/burden.html#burden-us>
- Centers for Disease Control and Prevention. (2021, March 5). About Norovirus. Centers for Disease Control and Prevention. Retrieved April 17, 2023, from <https://www.cdc.gov/norovirus/about/index.html>
- Centers for Disease Control and Prevention. (2023). Norovirus US Outbreak Map: CaliciNet. Centers for Disease Control and Prevention. Retrieved from <https://www.cdc.gov/norovirus/reporting/calicinet/data.html>
- Centers for Disease Control and Prevention. (2022, November 28). Preventing Norovirus. Centers for Disease Control and Prevention. Retrieved April 17, 2023, from <https://www.cdc.gov/norovirus/about/prevention.html>

The Impact of the COVID-19 Pandemic on Invasive Group A *Streptococcus* Incidence in Connecticut

Group A *Streptococcus* (GAS) bacteria can cause a range of illnesses from mild infections like strep throat and impetigo to more severe or life-threatening diseases including sepsis, cellulitis, necrotizing fasciitis, and streptococcal toxic shock syndrome. Severe manifestations of GAS typically result when disease is invasive (iGAS) and can lead to significant morbidity and mortality (1). The Centers for Disease Control and Prevention (CDC) estimates that between 14,000 to 25,000 iGAS cases and 1,500 to

2,300 iGAS-associated deaths occurred each year in the United States during the last five years (1).

Incidence of iGAS increases with age. Individuals ≥ 65 years of age are at highest risk of severe disease with 14% dying following an iGAS infection. Long-term care facility (LTCF) residents are at even higher risk and are 1.5 times more likely to die following an iGAS infection than similarly aged adults living in the community (2). Other risk factors include injection drug use, wounds/skin disease, and chronic medical conditions such as diabetes, cancer, immunosuppression, and chronic kidney, cardiac, or respiratory disease (3).

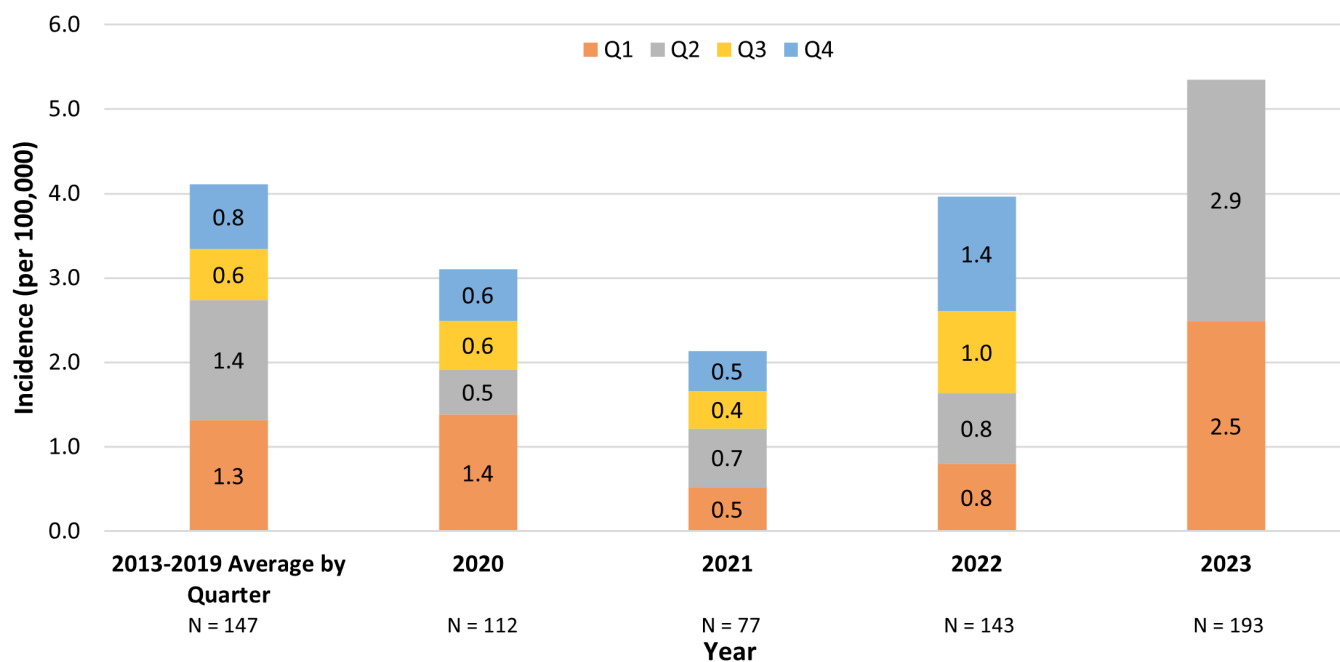
During the first two years of the COVID-19 pandemic (2020 and 2021), iGAS incidence in the United States decreased by about 25% in all age groups with incidence in children at historic lows (1). This was followed by an increase in pediatric iGAS in the fall of 2022 that prompted a CDC Health Advisory. Preliminary national 2022 data indicated that iGAS monthly incidence in children increased between September and November, earlier than the typical winter peak, concurrent with an increase in viral respiratory disease (3).

The Connecticut Department of Public Health (CT DPH) identifies iGAS cases (people with GAS identified in a normally sterile body site) through statewide active surveillance conducted by the Active Bacterial Core Surveillance project (4). Given recent national fluctuations in iGAS incidence, this article examines annual incidence (per 100,000) trends among CT residents overall and by age group during the pandemic (2020–2022) compared to the average

pre-pandemic (2013–2019) annual incidence. Seasonal trends were examined by comparing recent quarterly incidence (2022–June 2023) to the average pre-pandemic quarterly incidence overall and by age group.

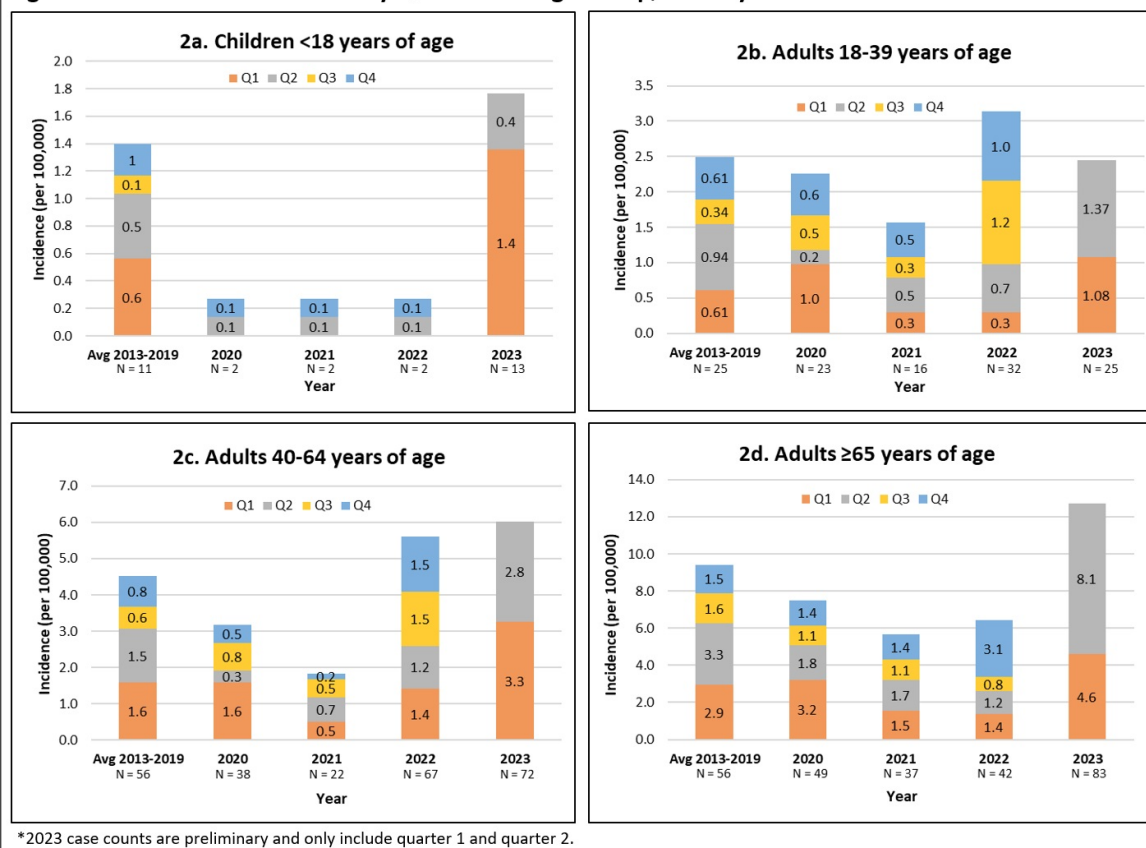
From January 2013–June 2023, 1,555 iGAS cases were identified. During the initial two years of the pandemic, annual incidence decreased by 49% (95% CI: 28–68%) compared to the pre-pandemic average (4.1 per 100,000 annual average in 2013–2019 to 2.1 in 2021) followed by a resurgence in 2022 to 4.0 per 100,000. [Figure 1] This same pattern was seen in all adult age groups with the largest resurgence in 2022 among those 40–64 years of age who had a 211% (95%CI: 123–295%) increase (1.8 per 100,000 in 2021 to 5.6 in 2022). While annual incidence decreased during the initial two years of the pandemic among those <18 years of age, this age group did not experience a resurgence in 2022 like older age groups did. [Figure 2]

Figure 1. Invasive GAS Incidence by Quarter, January 2013-June 2023*



*2023 case counts are preliminary and only include quarter 1 and quarter 2.

Figure 2. Invasive GAS Incidence by Quarter and Age Group, January 2013–June 2023*



Discussion

Overall incidence in the 4th quarter of 2022 was 75% higher (95%CI: 16–135%) than the pre-pandemic 4th quarter average (0.8 per 100,000 vs. 1.4) and was similar to rates typically seen in the 1st and 2nd quarters pre-pandemic. Increases continued into the 1st and 2nd quarters of 2023 when quarterly rates were 92% (95%CI: 42–140%) and 107% (95%CI: 54–151%) higher than corresponding quarter pre-pandemic averages (1.3 to 2.5 per 100,000 and 1.4 to 2.9 respectively). [Figure 1] This same pattern was seen among all adult age groups with the largest increases seen in those 40–64 years of age during the 1st quarter of 2023 (106%; 95%CI: 25–180%) and in those ≥65 years of age during the 2nd quarter of 2023 (138%; 95%CI: 59–218) (1.6 to 3.3 per 100,000 and 3.4 to 8.1 respectively). Among those <18 years of age, quarterly incidence remained lower than pre-pandemic averages until the 1st quarter of 2023 when it increased 180% (95%CI: -31–362%; 0.5 to 1.4 per 100,000) but then returned to average in the 2nd quarter of 2023. [Figure 2]

In Connecticut, iGAS incidence in both children and adults decreased at the onset of the COVID-19 pandemic in 2020. This is consistent with trends seen in other states and has been attributed to COVID-19 related non-pharmaceutical interventions (1). Incidence of iGAS remained lower than average until a resurgence in late 2022 in adults and in early 2023 in children. Incidence during just the first half of 2023 was similar to or higher than the pre-pandemic average yearly incidence both overall and in each age group. Increases were highest among those ≥65 years of age. This is concerning as risk of severe disease and death increases with age. Despite increases in pediatric iGAS in the fall of 2022 in other areas of the county (3), Connecticut did not see an increase in pediatric disease until the 1st quarter of 2023. However, this increase was not sustained into the 2nd quarter of 2023 as it was for adult age groups. This is encouraging as it might signal a potential future decline in average incidence levels for older age groups in the latter half of 2023.

Since there is no vaccine available for GAS, early recognition and treatment are essential to reduce disease burden. Providers should educate patients on signs and symptoms of iGAS and offer recommended vaccinations for viral infections that might proceed or occur concurrently with iGAS (e.g., influenza and varicella). Additionally, providers should consider iGAS infection during severe illnesses and obtain cultures for suspected infection, including blood, wound, and pleural fluid as indicated. The CT DPH should be notified of potential clusters that are recognized especially in congregate settings. Residents of LTCFs are at particularly high risk and

facility outbreaks can occur. CDC recently published a decision tool to guide LTCF personnel and public health officials in investigations of GAS infections in LTCFs (2). Prompt identification of iGAS cases in LTCFs is essential to allow for early intervention and implementation of the recommended control measures.

Continued iGAS surveillance is needed to assess whether changes in seasonal and age group incidence during the pandemic persist. Surveillance also allows for identification of clusters that might warrant public health intervention.

Reported by

A Hickey, MPH, S Petit, MPH, CT Department of Public Health Active Bacterial Core Surveillance Project

Acknowledgements

H H Wrigley, MPH, D Wurm, MPH, C Marquez

References

1. CDC. (2022, June 27). *Surveillance*. Retrieved from <https://www.cdc.gov/groupastrep/surveillance.html>
2. CDC. (2022, June 27). *Group A Strep in Long-term Care Facilities: Identifying and Managing Outbreaks*. Retrieved from <https://www.cdc.gov/groupastrep/outbreaks/lctf/index.html>
3. CDC Health Alert Network (HAN). (2022, December 22). Increase in Pediatric Invasive Group A Streptococcal Infections. CDCHAN-00484. Retrieved from <https://emergency.cdc.gov/han/2022/han00484.asp>
4. Connecticut Department of Public Health. (2023, January). Changes to the List of Reportable Diseases, Emergency Illnesses and Health Conditions, and the List of Reportable Laboratory Findings. Connecticut Epidemiologist Newsletter, 43(1), 2. Retrieved from <https://portal.ct.gov/DPH/Epidemiology-and-Emerging-Infections/The-Connecticut-Epidemiologist-Newsletter>

Connecticut Department of Public Health

Manisha Juthani, MD
Commissioner of Public Health

Lynn Sosa, MD
State Epidemiologist

Infectious Diseases Programs

Epidemiology and Emerging Infections
860-509-7994

Healthcare Associated Infections & Antimicrobial Resistance
860-509-7995

HIV & Viral Hepatitis
860-509-7900

Immunizations
860-509-7929

Sexually Transmitted Diseases
860-509-7920

Tuberculosis Control
860-509-7722

The Connecticut Epidemiologist Newsletter - (Telecommunications Relay Service 7-1-1)

Editor: Susan Petit, MPH

Assistant Editor: Amanda Durante, PhD, MSc

Assistant Editor/Producer: Chris Heneghan, MPH